REMARKS

I.   Introduction

In response to the Office Action mailed on January 18, 2005, no claims have been cancelled, amended or added. Claims 1-23 remain in the application. Entry of these remarks, and further re-consideration of the application is requested.

II.   Prior Art Rejections

In paragraph (3) of the Office Action, claims 1-6, 8, 9, 11-13, and 16-23 were rejected under 35 U.S.C. §102(b) as being anticipated by St. Ville, U.S. Patent No. 5,594,651 (St. Ville). The subsequent paragraphs (4) - (15) of the Office Action refer to claims 1-9, 12, 13, and 16-18 and 20-22 in this respect. In paragraph (16) of the Office Action, claims 10, 11, 19, and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over St. Ville in view of Roth, U.S. Patent No. 5,289,567 (Roth). In paragraph (19) of the Office Action, claims 14 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over St. Ville in view of Itoh et al., U.S. Patent No. 5,774,124 (Itoh).

Applicants' attorney respectfully traverses the rejections in light of the following arguments.

St. Ville does not anticipate the feature of the present invention that at least one graphical function of the CAD program is used to define a region within a face of a body, the region being used to define a load/support condition for an FEA calculation. This feature will be called feature (*) in the following.

With respect to feature (*), paragraph (4) of the Office Action refers to the following portions of St. Ville:

- graphics software program, Col. 13, Line 56;
- computer-aided design, Col. 13, Line 55 and Col. 1, Line 49;
- region A - F, Fig. 5A;
- step "Identify forces applied to object in intended application" in Fig. 1, Sheet 1/11, Fig. 2.

Paragraph (5) of the Office Action further refers to the following portion of St. Ville:

- region, Col. 12, Line 53.

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It has already been shown in detail in our submission filed on December 09, 2004, that none of the above-referenced portions of St. Ville, either alone or in combination, anticipate feature (*). Reference is made to the detailed discussion presented in our submission filed on December 09, 2004 in this respect. Perhaps most importantly, Fig. 5A of St. Ville is not relevant with respect to the present invention since Fig. 5A illustrates a real-life force acting on the hip of a living person. Col. 6, Lines 22-23 and Col. 8, Lines 35-36. Furthermore, elements A - F of Fig. 5A do not represent regions, but points. Col. 8, Line 38. Fig. 5A therefore does not show a graphical function of the CAD program, does not show a region, and does not show any definition of a load/support condition for an FEA calculation. Again, reference is made to our submission of December 09, 2004, with respect to the other above-mentioned portions of St. Ville.

In section (22) of the Office Action, the Examiner disagreed with the arguments presented in our submission of December 09, 2004. However, the Examiner based his assessment on portions of St. Ville that are different from the portions mentioned in sections (4) and (5) of the Office Action.

This line of reasoning of section (22) of the Office Action is difficult to understand. If the Examiner is of the opinion that the above-referenced portions of St. Ville anticipate feature (*), then the refutation of our arguments should also be based on these portions of St. Ville in section (22) of the Office Action. On the other hand, if the Examiner is of the opinion that the portions of St. Ville mentioned in section (22) of the present Office Action anticipate feature (*), then these portions should also be cited in paragraphs (4) and (5) of the present Office Action.

Furthermore, Applicants' attorney respectfully disagrees with the assessment given in section (22) of the Office Action. It is submitted that the additional portions of St. Ville cited in section (22) do not anticipate feature (*). The portions cited in section (22) are:

- Fig. 3: steps (2) of 21, 22, and 2nd of 23 (there is no 3rd item of 23 in Fig. 3);
- Finite Element Analysis [Fig. 3: step 24]; and
- Pre-Processing [Fig. 3: step 22 and Col. 8, Lines 58-59];
- Sentence of the abstract of St. Ville: "A computerized mathematical model of the object is generated by discretizing the geometric model of the object into a plurality of finite elements and defining nodes at boundaries of the elements, wherein values of the field {f} and potential {x} are specified at the nodes".

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The above portions of St. Ville will now be discussed in turn.

Fig. 3: steps (2) of 21, 22 and 2nd of 23 of St. Ville show various steps in the method of St. Ville. Col. 6, Lines 38-40.

Item (2) of step 21 reads "Forces ({f}) are known". This item refers to a force field that will be applied to the object in its intended use. Col. 8, Lines 1-3. There is no indication that these forces would be defined using a graphical function of a CAD program, and there is no indication that forces acting on a region within a face of a body (and not merely a point) can be defined. To the contrary, it would appear that the CAD program is only used later, namely in step 22.

Step 22 of Fig. 3 of St. Ville reads "Design model geometry". Here, computer aided design is used to geometrically model the object to be manufactured. Col. 8, Lines 58-59. There is no indication that any forces or load/support conditions are defined during this step.

The second item of step 23 of Fig. 3 reads "Input boundary conditions, including forces & potentials". This item apparently refers to Col. 10, Lines 27-31, which read "The finite element model is completed by specifying the values and/or directions of the above-described fields {f} and potentials {x} at the nodes of the discretized object. In addition, any appropriate boundary conditions are imposed." It should be noted that this description refers to the finite element model and not to the geometrical (CAD) model. The finite element model is created from the geometrical (CAD) model using an appropriate software package like, e.g., I-DEAS, MSC/NASTRAN, ABAQUS, and ANSYS. Col. 9, Lines 45-46 and 50-59. None of these software packages are CAD programs. It is therefore apparent that no graphical CAD function can be used during this step.

All in all, Fig. 3 of St. Ville discloses that the forces {f} are known (item (2) of step 21) before the model geometry is designed (step 22). This order of steps teaches away from the present invention because, according to feature (*), the load/support condition is defined using a region that has in turn been defined using a graphical function of the CAD program. In other words, according to the present invention the load/support condition can only be defined after the CAD program has been used to define the region.

Fig. 3: step 24 of St. Ville discloses the finite element analysis. The present invention is not concerned with this step, but with the preliminary step of defining at least one parameter for a finite elements analysis.

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The pre-processing of Fig. 3: step 22 and Col. 8, Lines 58-59, has already been discussed above. Again, this step just concerns the creation of the CAD model. It does not concern the definition of any load/support conditions since these conditions, according to the method of St. Ville, have already been defined earlier in item (2) of step 21.

The sentence of the abstract of St. Ville "A computerized mathematical model of the object is generated by discretizing the geometric model of the object into a plurality of finite elements and defining nodes at boundaries of the elements, wherein values of the field $\{f\}$ and potential $\{x\}$ are specified at the nodes" has been cited in the Office Action with the assessment that not only forces acting on points could be defined but forces acting of regions within faces could also be defined. This assessment is contested. The sentence discloses that values (possibly force values) at the nodes are defined. By definition, a node is always a point and never a region. Therefore, even if the "values at the nodes" related to the load/support conditions, it would be values acting on points (i.e., nodes) and not regions. Furthermore, the sentence refers to the node and element generation of step 23 of Fig. 3 of St. Ville. This is apparent from the words "elements" and "nodes" and also from the fact that the step of designing a geometric model of the object is mentioned in the abstract before the sentence cited by the Examiner. Therefore, this sentence cited by the examiner does not have any relation to the geometric (CAD) model generation of step 22.

All in all, the cited sentence of the abstract of St. Ville neither discloses the use of any graphical CAD functions to define regions, nor discloses the use of such regions to define a load/support condition for the FEA calculation.

Thus, Applicants submit that independent claims 1, 16, and 20 are allowable over St. Ville, Roth, and Itoh. Further, dependent claims 2-15, 17-19, and 21-23 are submitted to be allowable over St. Ville, Roth, and Itoh in the same manner, because they are dependent on independent claims 1, 16, and 20, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-15, 17-19, and 21-23 recite additional novel elements not shown by St. Ville, Roth, and Itoh.

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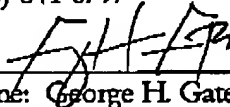G&C 30566.123-US-01

III. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

GATES & COOPER LLP
Attorneys for Applicants

Howard Hughes Center
6701 Center Drive West, Suite 1050
Los Angeles, California 90045
(310) 641-8797

Date: March 18, 2005

By: _____
Name: George H. Gates
Reg. No.: 33,500

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